

CLAIMS

That which is claimed is:

1. A polymerization process comprising:
polymerizing in a loop reaction zone, at least one olefin monomer to produce a fluid slurry comprising a liquid medium and solid olefin polymer particles;
withdrawing, through a take-off valve, a portion of the fluid slurry as withdrawn slurry; and
repetitively fully closing and opening the take-off valve at set intervals, such that the withdrawn slurry is removed from the reactor discontinuously;
wherein the take-off valve is not located in a settling leg.
2. A process according to claim 1 wherein the take-off valve comprises a ball valve.
3. A process according to claim 1 further comprising maintaining a concentration of the solid olefin polymer particles in the fluid slurry in the reaction zone of greater than 40 weight percent based on the weight of the solid olefin polymer particles and the weight of the liquid medium.
4. A process according to claim 1 wherein the reaction zone has a volume of greater than 20,000 gallons.
5. A process according to claim 1 wherein the reaction zone has a volume of greater than 30,000 gallons.
6. A process according to claim 1 wherein the reaction zone has a volume of greater than 35,000 gallons.

7. A process according to claim 1 wherein the take-off valve is fully opened at set intervals.

8. A process according to claim 1 wherein the take-off valve is operated at a baseline openness of from about 20% to about 60%, and said take-off valve periodically fully opens and fully closes.

9. A process according to claim 1 wherein the take-off valve is at least 60% open at set intervals.

10. A process according to claim 1 wherein the set intervals for repetitively fully closing and opening the take-off valve extend through substantially all of the polymerizing step.

11. A polymerization process comprising:
polymerizing in a loop reaction zone, at least one olefin monomer to produce a fluid slurry comprising a liquid medium and solid olefin polymer particles;
withdrawing, through a take-off valve, a portion of the fluid slurry as withdrawn slurry; and
closing and opening the take-off valve in a repetitive pattern.

12. A process according to claim 11 wherein the closing and opening comprises closing and opening the take-off valve in a sine wave pattern.

13. A process according to claim 11 wherein the closing and opening in a repetitive pattern comprises closing and opening the take-off valve in a modified sine wave pattern.

14. A process according to claim 13, wherein the modified sine wave pattern has a peak and a trough, and the take-off valve is fully closed at the trough of the modified sine wave pattern.

15. A process according to claim 14 wherein the take-off valve is fully open at the peak of the modified sine wave pattern.

16. A process according to claim 11 wherein the take-off valve is a ball valve.

17. A process according to claim 11 further comprising maintaining a concentration of the solid olefin polymer particles in the fluid slurry in the reaction zone of greater than 40 weight percent based on the weight of the olefin polymer particles and the weight of the liquid medium.

18. A process according to claim 11 wherein the reaction zone has a volume of greater than 20,000 gallons.

19. A process according to claim 11 wherein the reaction zone has a volume of greater than 30,000 gallons.

20. A process according to claim 11 wherein the reaction zone has a volume of greater than 35,000 gallons.